

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report Proposed Rule 1420.2 – Emission Standards for Lead from Metal Melting Facilities

April 2015

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BACKGROUND

The South Coast Air Quality Management District (SCAQMD) is responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin). By state law, the SCAQMD is required to adopt an Air Quality Management Plan (AQMP) demonstrating compliance with all federal regulations and standards such as National Ambient Air Quality Standards (NAAQS) for the Basin [H&S Code Section 40460 (a)].

In October 1978, the U.S. Environmental Protection Agency (EPA) promulgated the primary and secondary NAAQS for lead under section 109 of the Clean Air Act. Both primary and secondary standards were set at a level of 1.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) averaged over a calendar quarter. Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.

On October 15, 2008, the EPA amended both the primary and secondary NAAQS for lead from a level of 1.5 $\mu\text{g}/\text{m}^3$ to 0.15 $\mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period, along with changes to monitoring and reporting requirements. On December 31, 2010, the EPA designated a portion of Los Angeles County as non-attainment for the 2008 NAAQS for lead based on monitored air quality data from 2007-2009 that indicated a violation of the NAAQS for two large lead-acid battery recycling facilities. Consequently, SCAQMD Rule 1420.1 – Emission Standards for Lead from Large Lead-acid Battery Recycling Facilities was adopted on November 5, 2010 to control emissions of lead from large lead-acid battery recycling facilities in order to reduce lead emissions and help ensure attainment with the 2008 NAAQS for lead of 0.150 $\mu\text{g}/\text{m}^3$. In May of 2014, the U.S. EPA released its “Policy Assessment for the Review of the Lead National Ambient Air Quality Standards,” reaffirming the primary (health-based) and secondary (welfare-based) staff conclusions regarding whether to retain or revise the current standards. As a result, in January of 2015 the U.S. EPA proposed that the ambient lead concentration standard of 0.15 $\mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period remain unchanged. The 90-day comment period for this proposal ended on April 6, 2015 and requires further action by the U.S. EPA.

Rule 1420.1 has proven effective for attainment demonstration with the lead NAAQS by the large lead-acid battery recycling industry, however, SCAQMD staff is concerned with lead emissions from the broader industry source category of metal melting. Based on SCAQMD annual emission inventories submitted through the SCAQMD Annual Emissions Reporting (AER) program and permitting information for equipment processing and handling lead, the SCAQMD staff has determined that the metal melting industry is the most significant stationary source of reported lead emissions. Existing federal and state regulations currently control lead emissions from this source category, however, additional requirements similar to those that have effectively reduced emissions from large lead-acid battery recyclers may be necessary to adequately protect public health. As a result, SCAQMD staff is proposing that the SCAQMD Governing Board adopt Proposed Rule (PR) 1420.2. Specifically, the objective of PR 1420.2 is to protect public health by minimizing public exposure to lead emissions and preventing exceedances of the lead NAAQS in the Basin.

PUBLIC PROCESS

PR 1420.2 is being developed through a public process. A working group has been formed to provide the public and stakeholders an opportunity to discuss important details about the proposed rule and provide the SCAQMD staff with important input during the rule development process. The working group and interested parties are comprised of a variety of stakeholders including representatives from industry, consultants, environmental groups, community groups, and public agency representatives. The SCAQMD staff has held four (4) working group meetings. To date, the working group has convened on December 17, 2014, January 20, 2015, February 19, 2015 and on April 23, 2015. A Public Workshop has been scheduled for May 14, 2015 to present the proposed rule and receive public comment.

LEAD

Lead is a naturally occurring metal found in the earth's crust. The metal is grayish in color and is soft, malleable, and ductile. It is also a limited electrical conductor and highly impervious to corrosion. This unique combination of physical properties has made it desirable for many uses in industries such as construction, piping, roofing, and lead-acid storage battery manufacturing. As a result, some business operations solely recover lead from lead-bearing materials through secondary smelting operations for use in the abovementioned industries. For some industries, lead is undesirable and considered an impurity to its final product. Lead for these industries results from the melting of recycled scrap metal that either contain trace amounts of lead, or inadvertently enter the process even after inspection to identify scrap metal that may contain lead.

HEALTH EFFECTS

Lead is classified as a "criteria pollutant" under the federal Clean Air Act. It is also identified as a carcinogenic toxic air contaminant (TAC) by the Office of Environmental Health Hazard Assessment (OEHHA). Chronic health effects include problems such as nervous and reproductive system disorders, neurological and respiratory damage, cognitive and behavioral changes, and hypertension. Also, exposure to lead may increase the risk of contracting cancer or result in other adverse health effects. Young children are especially susceptible to the effects of environmental lead given that their bodies accumulate lead more readily than do adults and because they are more vulnerable to certain biological effects of lead including learning disabilities, behavioral problems, and deficits in IQ.

During the U.S. EPA's recent review of the lead NAAQS the U.S. EPA Administrator concluded that the current lead NAAQS of $0.15 \mu\text{g}/\text{m}^3$ should be retained given that it provides requisite protection of public health. However, the Administrator noted that a threshold blood-lead level with which nervous system effects, and specifically, cognitive effects, occur in young children cannot be discerned from the currently available studies. Further, in the U.S. EPA's recent Policy Assessment for the Review of the Lead NAAQS, the U.S. EPA explicitly stated "with regard to our understanding of the relationship between exposure or blood lead levels in young children and neurocognitive effects, the evidence in this review...does not establish a threshold blood lead level for neurocognitive effects in young children. Furthermore, based on

information provided in the U.S. EPA's recent policy assessment document and proposed rule, an ambient lead concentration of $0.15 \mu\text{g}/\text{m}^3$ correlates to a potential IQ decrement of approximately (2) points in young children exposed to elevated levels of lead. As a result, SCAQMD staff is proposing additional measures in PR 1420.2 to reinforce the protection of public health from significant sources of lead emissions.

AFFECTED SOURCES

Based on lead emissions inventories reported to the SCAQMD AER program (i.e., for years 2010 through 2012) and information available from the SCAQMD permitting database, there are approximately 14 metal melting facilities expected to be subject to PR 1420.2. Cumulatively these facilities process more than 50,000 tons of lead annually through a combination of metal melting furnaces.

PROPOSED RULE 1420.2

The purpose of PR 1420.2 is to protect public health by reducing public exposure to lead emissions from metal melting facilities and to help ensure attainment and maintenance of the NAAQS for lead. Beginning date of adoption, the proposed rule will require metal melting facilities to comply with an ambient air lead concentration limit of $0.150 \mu\text{g}/\text{m}^3$, averaged over any consecutive 30 days. Further, on and after January 1, 2018, the ambient air lead concentration limit will be lowered to $0.100 \mu\text{g}/\text{m}^3$, averaged over any consecutive 30 days. In addition to the ambient air lead concentration limit, PR 1420.2 contains requirements for lead point source emissions controls and standards, ambient air monitoring, total enclosures of areas where metal melting operations and associated operations are conducted, housekeeping and maintenance activity measures, periodic source testing, and reporting and recordkeeping requirements. Metal melting facilities that exceed the ambient air concentration limits will be subject to additional requirements including enhanced emission controls, total enclosures with negative air, housekeeping measures, and compliance plan submittal.

SOCIOECONOMIC ASSESSMENT

A socioeconomic analysis will be conducted and released for public review and comment at least 30 days prior to the SCAQMD Governing Board hearing on PR 1420.2, which is anticipated to be heard on July 10, 2015.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, the SCAQMD staff will evaluate the proposed project and make the appropriate CEQA determination. The public workshop meeting will also solicit public input on any potential environmental impacts from the proposed project. Comments received at the public workshops on any environmental impacts will be considered when developing the final CEQA document for this rulemaking.

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AND CONTROL STRATEGIES**

INTRODUCTION

The purpose of PR 1420.2 is to protect public health by reducing public exposure to lead emissions from metal melting facilities and to help ensure attainment and maintenance of the NAAQS for lead. As required by the federal Clean Air Act, the U.S. EPA periodically reviews the standard to determine if changes are warranted. Based on review of health studies, the U.S. EPA has determined that the standard of $1.5 \mu\text{g}/\text{m}^3$ set in 1978 was not sufficient to protect public health and welfare with an adequate margin of safety. The standard has been lowered to $0.15 \mu\text{g}/\text{m}^3$ based on studies that demonstrate health effects at much lower levels of lead exposure than previously believed. The new standard provides increased protection for children and other at-risk populations against an array of health effects, most notably neurological effects in children, including neurocognitive and neurobehavioral effects.

On October 15, 2008, the EPA amended both the primary and secondary NAAQS for lead from a level of $1.5 \mu\text{g}/\text{m}^3$ to $0.15 \mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period, along with changes to monitoring and reporting requirements. On December 31, 2010, the EPA designated a portion of Los Angeles County as non-attainment for the 2008 NAAQS for lead based on monitored air quality data from 2007-2009 that indicated a violation of the NAAQS for two large lead-acid battery recycling facilities. Consequently, SCAQMD Rule 1420.1 – Emission Standards for Lead from Large Lead-acid Battery Recycling Facilities was adopted on November 5, 2010 to control emissions of lead from large lead-acid battery recycling facilities in order to reduce lead emissions and help ensure attainment with the 2008 NAAQS for lead of $0.150 \mu\text{g}/\text{m}^3$.

In May of 2014, the U.S. EPA released its “Policy Assessment for the Review of the Lead National Ambient Air Quality Standards,” reaffirming the primary (health-based) and secondary (welfare-based) staff conclusions regarding whether to retain or revise the current standards. As a result, in January of 2015 the U.S. EPA proposed that the ambient air lead concentration standard of $0.15 \mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period remain unchanged. The 90-day comment period for this proposal ended on April 6, 2015 and requires further action by the U.S. EPA.

Rule 1420.1 has proven effective for attainment demonstration with the lead NAAQS by the large lead-acid battery recycling industry, however, SCAQMD staff is concerned with lead emissions from the broader industry source category of metal melting. The 2012 Lead SIP identified amendment of SCAQMD Rule 1420 – Emissions Standards for Lead as the primary lead control measure. During the rule development process for PAR 1420.1, the SCAQMD staff conducted a comprehensive review of lead emissions data reported through the SCAQMD AER Program, permitting data, compliance data and source test results garnered from the AB 2588 Air Toxics Program. Based on this review, SCAQMD staff determined that the metal melting industry is the most significant stationary source of reported lead emissions in the Basin. Further, a review of historical ambient air lead concentration data measured by the SCAQMD’s air monitoring network have indicated that some metal melting facilities have the potential for elevated ambient concentrations of lead. In addition, the 2010 Clean Communities Plan (CCP) specified that the SCAQMD staff would investigate other sources of lead emissions and identify control measures to address lead emissions from these identified stationary sources. For example, the CCP included control measure Stationary-01 (Lead Emissions), the objective of

which is to reduce lead exposure to the public from lead related activities and comply with the 2008 adopted NAAQS for lead.

Currently, Rule 1420 applies to both metal melting facilities, however, since the SCAQMD Governing Board adopted Rule 1420 in 1992, an abundance of new and updated information including, but not limited to, lead emissions data, ambient air monitoring data and emissions control techniques have become available. Further, the lead NAAQS has been lowered tenfold from $1.5 \mu\text{g}/\text{m}^3$ to $0.15 \mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period. Although existing federal and state regulations also control lead emissions from this source category, additional requirements similar to those that have effectively reduced emissions from large lead-acid battery recyclers may be necessary to adequately protect public health. Through the preliminary rule development efforts for PAR 1420, SCAQMD staff recognized the difficulty in developing lead control requirements for this source category within a general lead rule that controls multiple source categories (Rule 1420). As a result, staff is proposing a similar policy approach (i.e., source specific requirements) for metal melting facilities under PR 1420.2. Specifically, the objective of PR 1420.2 is to protect public health by minimizing public exposure to lead emissions and preventing exceedances of the lead NAAQS in the Basin.

PUBLIC PROCESS

PR 1420.2 is being developed through a public process. A working group has been formed to provide the public and stakeholders an opportunity to discuss important details about the proposed rule and provide the SCAQMD staff with important input during the rule development process. The working group and interested parties are comprised of a variety of stakeholders including representatives from industry, consultants, environmental groups, community groups, and public agency representatives. The SCAQMD staff has held four (4) working group meetings. To date, the working group has convened on December 17, 2014, January 20, 2015, February 19, 2015 and on April 23, 2015. A Public Workshop has been scheduled for May 14, 2015 to present the proposed rule and receive public comment.

LEAD

Lead is a naturally occurring metal found in the earth's crust. The metal is grayish in color and is soft, malleable, and ductile. It is also a limited electrical conductor and highly impervious to corrosion. This unique combination of physical properties has made it desirable for many uses in industries such as construction, piping, roofing, and lead-acid storage battery manufacturing. As a result, some business operations solely recover lead from lead-bearing materials through secondary smelting operations for use in the abovementioned industries. For some industries, lead is undesirable and considered an impurity to its final product. Lead for these industries results from the melting of recycled scrap metal that either contain trace amounts of lead, or inadvertently enter the process even after inspection to identify scrap metal that may contain lead.

HEALTH EFFECTS OF LEAD

Lead is classified as a “criteria pollutant” under the federal Clean Air Act. The Office of Environmental Health Hazard Assessment (OEHHA) also identifies it as a carcinogenic toxic air contaminant (TAC). Chronic health effects include problems such as nervous and reproductive system disorders, neurological and respiratory damage, cognitive and behavioral changes, and hypertension. Exposure to lead can also potentially increase the risk of contracting cancer or result in other adverse health effects. Young children are especially susceptible to the effects of environmental lead because their bodies accumulate lead more readily than do those of adults, and because they are more vulnerable to certain biological effects of lead including learning disabilities, behavioral problems, and deficits in IQ. The Center for Disease Control and Prevention has summarized these effects in Figure 1-1 below:

Figure 1-1: Health Effects of Lead



The California Office of Environmental Health Hazard Assessment (OEHHA) has developed a 1 µg/dL benchmark for source-specific incremental change in blood levels for protection of children. The California Human Health Screening Levels (CHHSL) represent concentrations in soil that have no more than a 2.5% probability of decreasing IQ by more than 1 point in a 90th percentile child or fetus. The benchmark was established to estimate a concentration in soil that would lead to an incremental increase in blood lead of up to 1 µg/dL to a child resident. Using DTSC’s Leadsread model, OEHHA determined that a residential exposure to lead in soil or dust of 77 µg/g would result in an incremental increase in blood lead to 1 µg/dL. However, there is no established way to translate stack emissions at a point source directly to lead content in soil. Stack emissions are dispersed over an area in and around the facility in relatively small amounts. However, when allowed to accumulate over many years, as they clearly have in the two communities surrounding the Exide and Quemetco, the levels could exceed 77 µg/g. The U.S. EPA examined similar thresholds when establishing the lead NAAQS. However, rather than using stack emission limits with its inherent limitations, U.S. EPA established a standard based on the ambient lead concentration. When reviewing the current federal standard, U.S. EPA reviewed the median IQ loss associate with lead exposure for the median child. Their estimations of risk are approximate as noted by the ranges presented below in Table 1-1 taken from the U.S. EPA’s Policy Assessment for the Review of the Lead National Ambient Air Quality Standards, May 2014. The bolded range represents the range with the highest overall

confidence. The proposed maximum 30 consecutive day limit of $0.150 \mu\text{g}/\text{m}^3$ as seen below is more health protective than the existing federal limit. The proposed final concentration of $0.100 \mu\text{g}/\text{m}^3$ will be even more health protective, but the uncertainties in the estimates prevent a determination if the proposed limit, prevent the loss of one IQ point in a child resident. It should be noted that U.S. EPA and SCAQMD staff concur that ambient lead concentrations, and not total facility mass lead emissions are the primary indicator of health impacts to the surrounding community.

Table 1-1: Estimates of Air Related Risk for the Generalized (local) Urban Case Study, including Interpolated Estimates for Current Standard

Air Quality Scenario Just meeting specified metric ($\mu\text{g}/\text{m}^3$)			Median Air-related IQ Loss ^A for Generalized (local) Urban Case Study
Maximum Quarterly Average ^D	Maximum Monthly Average	Maximum 3-month Average	
1.5 (previous NAAQS)			3.5 - 4.8 (1.5 - 7.7)
	0.5		1.9 - 3.6 (0.7 - 4.8)
0.2			1.5 - 3.4 (0.5 - 4.3)
		0.15 ^B (current NAAQS)	1.5 - 3.4 (0.5 - 4.3)
	0.2		1.2 - 3.2 (0.4 - 4.0)
	0.05		0.5 - 2.8 (0.2 - 3.3)
	0.02		0.3 - 2.6 (0.1 - 3.1)
<p>A - Air-related risk is bracketed by "recent air" (lower bound of presented range) and "recent" plus "past air" (upper bound of presented range) (see section 3.4.4 for additional detail on these categories). Boldface estimates are generated using the C-R function in which we have the highest overall confidence (the log-linear with low-exposure linearization). Values in parentheses reflect the range of estimates associated with all four concentration-response functions (see discussion in section 3.4.3.3.1). Values in parentheses reflect the range of estimates associated with all four concentration-response functions.</p> <p>B - Risk estimates interpolated - see text.</p>			

REGULATORY HISTORY

The metal melting industry has been subject to regulation regarding lead for more than two decades. Below is a chronology of regulatory activity:

- November 1970, CARB set the state ambient air quality standard for lead at $1.5 \mu\text{g}/\text{m}^3$ averaged over 30 days.

- October 1978, the U.S. EPA adopted the NAAQS for lead, requiring attainment with a lead ambient concentration of $1.5 \mu\text{g}/\text{m}^3$ averaged over a calendar quarter.
 - September 1992, the SCAQMD adopted Rule 1420 – Emissions Standard for Lead. The rule incorporated the state ambient air quality standard and required control devices on lead emission points, control efficiency requirements for lead control devices, housekeeping, and monitoring or modeling of ambient air quality.
 - October 1992, OEHHA classified lead as a carcinogenic toxic air contaminant and assigned to it a cancer potency factor and a cancer unit risk factor.
 - January 1993, CARB adopted the Airborne Toxic Control Measure for Emissions of Toxic Metals from Non-Ferrous Metal Melting. The state regulation required control devices for lead and other toxic metal emission points, control efficiency requirements for control devices, fugitive emission control, and recordkeeping.
 - June 1997, the U.S. EPA adopted the National Emissions Standards for Hazardous Air Pollutants (NESHAP) from Secondary Lead Smelting. The federal regulation required lead emission concentration limits of lead control devices, control of process fugitive emissions, monitoring, recordkeeping, and reporting.
 - On July 16, 2007, EPA finalized a regulation that affects lead emissions from all lead-acid battery manufacturing facilities that are area sources. The federal regulation required lead emission concentration limits, testing, monitoring, recordkeeping, and reporting requirements.
 - On October 15, 2008, the U.S. EPA signed into regulation an amended NAAQS for lead of $0.15 \mu\text{g}/\text{m}^3$.
 - November 5, 2010, the SCAQMD adopted Rule 1420.1 – Emissions Standard for Lead from Large Lead-acid Battery Recycling Facilities. The rule established requirements for total enclosures of areas used in the lead-acid battery recycling operation, ambient air lead concentration limits, ambient air monitoring, and housekeeping practices. Additional rule amendments followed the initial adoption in January of 2014, March of 2014, and March of 2015.
 - December 14, 2010, the U.S. EPA made final revisions to the ambient monitoring requirements for measuring lead in the air. These amendments expand the nation's lead monitoring network to better assess compliance with the 2008 National Ambient Air Quality Standards for lead.
 - January 2, 2015, the U.S. EPA proposed that the ambient lead concentration standard of $0.15 \mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period remain unchanged. The 90-day comment period for this proposal ended on April 6, 2015 and requires further action by the U.S. EPA.
- The following provides additional background information about Rule 1420 and the 2008 NAAQS for lead.

Rule 1420

Rule 1420 was adopted in September 1992 and has not been amended since its adoption. Rule 1420 applies to facilities that process or use lead-containing materials that include, but is not limited to, primary or secondary lead smelters, foundries, lead-acid battery manufacturers or recyclers, and lead-oxide, brass and bronze producers. Rule 1420 is based on the current state ambient air quality standard of $1.5 \mu\text{g}/\text{m}^3$ averaged over a 30-day period. The rule includes requirements for point source controls, monitoring, sampling, recordkeeping, and reporting. Rule 1420 requires facilities that process more than two tons of lead per year to submit a

Compliance Plan that provides information on how the facility will conduct monitoring, air dispersion modeling, and implement requirements to install and implement point source controls.

2008 NAAQS for Lead

Since U.S. EPA established the initial standard of $1.5 \mu\text{g}/\text{m}^3$ in 1978, scientific evidence about lead and health has expanded dramatically. More than 6,000 new studies on lead health effects, environmental effects, and lead in the air have been published since 1990. Evidence from health studies shows that adverse effects occur at much lower levels of lead in the blood than previously thought. As a result, U.S. EPA amended the NAAQS for lead that now reduces the ambient air quality standard from $1.5 \mu\text{g}/\text{m}^3$ to $0.15 \mu\text{g}/\text{m}^3$. The 2008 lead NAAQS requires full attainment by each state no later than five years after final designations for attainment status are made. Demonstration of attainment is based on measurements using a rolling 3-month averaging form to be evaluated over a 3-year period. Measurements are to be determined by U.S. EPA-required monitoring networks within each state which consist of both source-oriented and non-source-oriented monitors. The SCAQMD has already established the required monitoring network for both source and non-source-oriented lead monitors.

Further, in May of 2014, the U.S. EPA released its “Policy Assessment for the Review of the Lead National Ambient Air Quality Standards,” reaffirming the primary (health-based) and secondary (welfare-based) staff conclusions regarding whether to retain or revise the current standards. As a result, in January of 2015 the U.S. EPA proposed that the ambient lead concentration standard of $0.15 \mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period remain unchanged. The 90-day comment period for this proposal ended on April 6, 2015 and requires further action by the U.S. EPA.

2008 NAAQS ATTAINMENT STATUS

The 2008 NAAQS for lead requires that each state install and operate a network of ambient air lead monitors in order to determine attainment status with the standard. Two types of monitors are required; those that are population-based referred to as “non-source-oriented,” and those that are facility-based referred to as “source-oriented.” The lead attainment assessment conducted by the state of California was based on data from both sets of monitoring networks. On October 14, 2009, the CARB recommended to the U.S. EPA that the South Coast Air Quality Management District portion of Los Angeles County be designated as non-attainment for the 2008 federal lead standard based on data from the ATSF and Rehrig-Pacific Street monitors for Exide Technologies (Exide). On December 31, 2010, the U.S. EPA designated a portion of Los Angeles County, excluding the high desert areas, San Clemente and Santa Catalina Islands (southern Los Angeles County), as nonattainment for the 2008 lead NAAQS and required attainment no later than December 31, 2015. As a result, the SCAQMD Governing Board adopted the 2012 Lead State Implementation Plan (SIP), outlining the strategies, planning and air pollution control activities to demonstrate attainment with the lead NAAQS before December 31, 2015.

Lead Ambient Air Monitoring Requirements

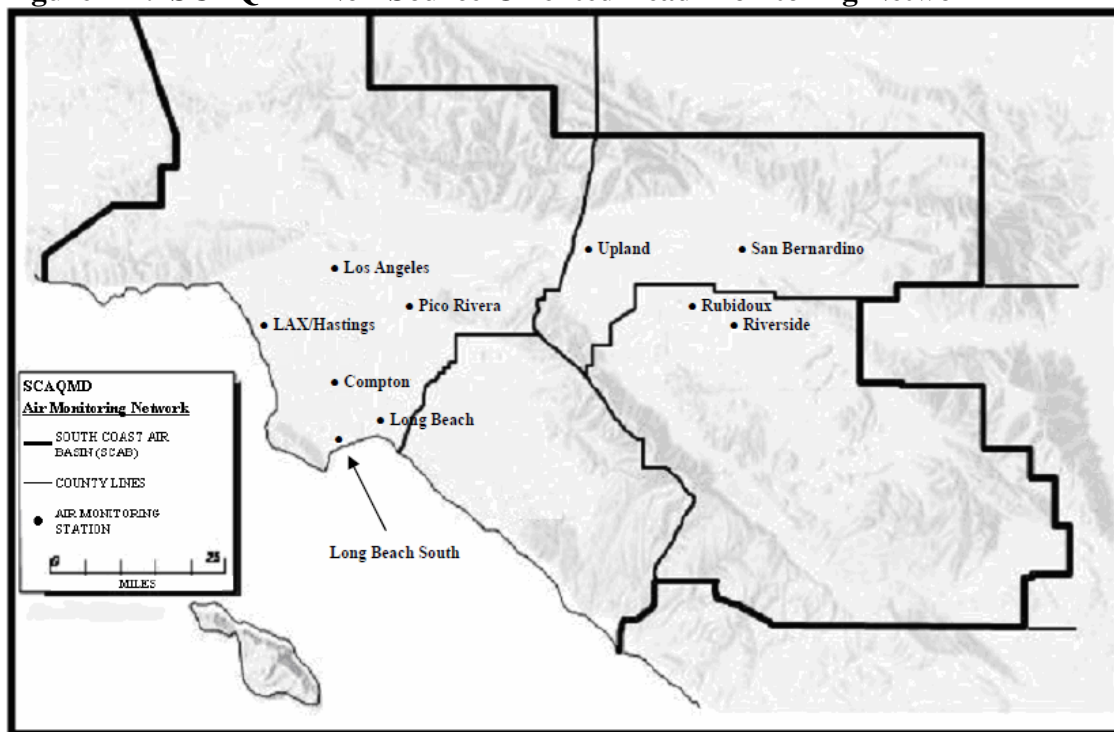
On December 14, 2010, the U.S. EPA revised the ambient monitoring requirements for measuring lead in the air. Specifically, the U.S. EPA changed the emissions threshold that state

monitoring agencies must use to determine if an air quality monitor should be placed near an industrial facility that emits lead (source-oriented monitor). The new lead emissions threshold is 1,000 pounds per year (lbs/yr) of lead emissions reduced from the previous threshold of 1.0 tons per year (tpy). U.S. EPA maintained the 1.0 tpy lead emissions threshold for airports. U.S. EPA also requires lead monitoring in large urban areas, Core Based Statistical Areas with a population of 500,000 people or more (non-source-oriented monitors).

Non-Source-Oriented Monitors

The SCAQMD currently operates a non-source-oriented monitoring network of 10 locations throughout the Basin. The spatial distribution of these sites is shown below in Figure 1-1. The SCAQMD's current lead monitoring network meets the minimum requirements for the U.S. EPA non-source-oriented monitoring network as specified in the new lead NAAQS, therefore data from the existing monitors were used to provide an indication of lead attainment status on a regional scale. Data values from measurements made at non-source-oriented monitors in the Basin were reviewed for years 2007 through 2013 and showed concentrations well below the 2008 NAAQS for lead of $0.15 \mu\text{g}/\text{m}^3$ and range from $0.01 \mu\text{g}/\text{m}^3$ to $0.03 \mu\text{g}/\text{m}^3$.

Figure 1-2: SCAQMD Non-Source-Oriented Lead Monitoring Network

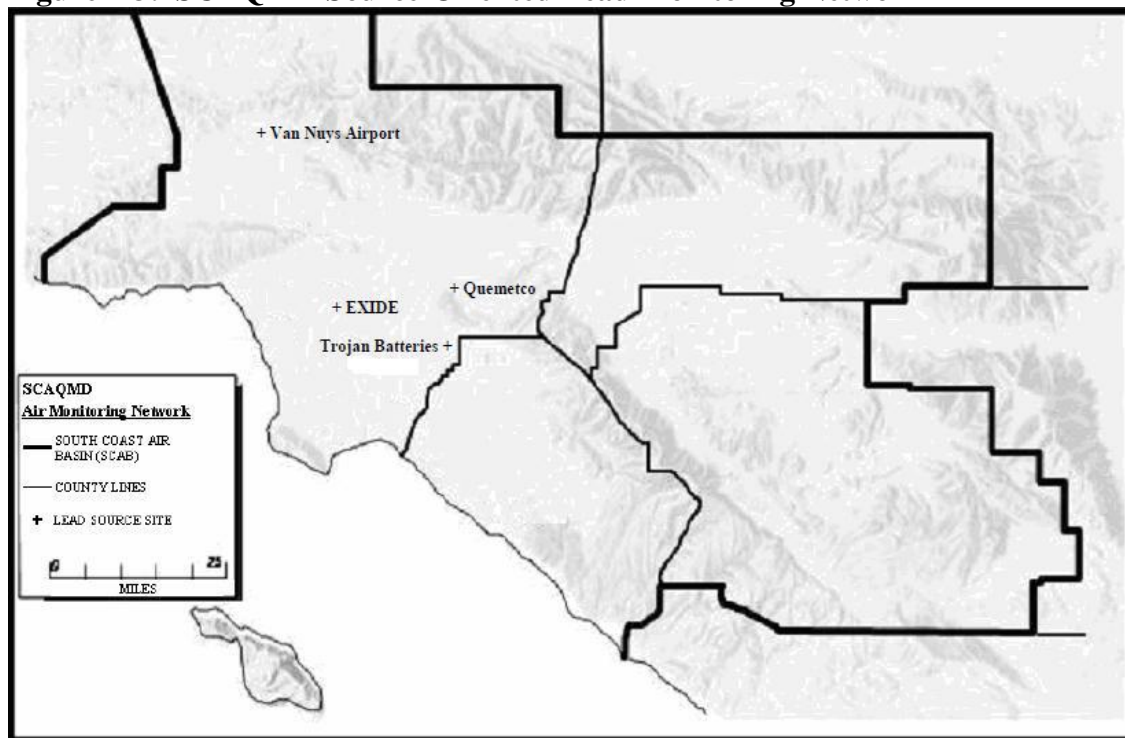


Source-Oriented Monitors

The SCAQMD currently operates existing source-oriented monitoring networks at the following three facilities: Trojan Battery Company in Santa Fe Springs, Quemetco, Inc. in the City of Industry, and Exide Technologies in Vernon, and one additional network recently installed at Van Nuys Airport to meet the monitoring requirements of the new lead NAAQS. General aviation aircraft use leaded aviation fuel, and have been identified as a source of lead emissions. Although required to conduct source-oriented monitoring of this source according to U.S. EPA

regulations, the SCAQMD currently does not have jurisdiction for regulating the aviation gas formulation or the aircraft emissions since it is a mobile source. Figure 1-2 below shows the locations of SCAQMD's current source-oriented monitoring networks and their respective lead sources.

Figure 1-3: SCAQMD Source-Oriented Lead Monitoring Network



Based on data from AER reporting years 2005 through 2007, lead emissions at Trojan Battery, a battery manufacturer located in Santa Fe Springs, were reported as 29 lbs/yr and sampling was conducted one site. The site operates on a 1-in-6 day sampling schedule and had its highest monthly average of $0.23 \mu\text{g}/\text{m}^3$ in May 2007. Recent lead emissions data for Trojan Battery indicate an annual lead emissions value of 11.12 lbs/year and a maximum 3-month average ambient lead concentration of $0.12 \mu\text{g}/\text{m}^3$.

AMBIENT AIR MONITORING AT PR 1420.2 FACILITIES

There are two Proposed Rule 1420.2 facilities that currently have ambient air monitors to demonstrate compliance with the ambient air lead concentration limit of Rule 1420, or have ambient air monitors that are used by the SCAQMD for compliance demonstration with the 2008 NAAQS for lead. These two facilities are Trojan Battery (which was discussed above) and Gerdau-Tamco. Monitors are typically sited based on the maximum expected ground-level concentrations of lead at or beyond the property line of the facility. Monitoring data from these two facility types under the source category of metal melting have exhibited high ambient air lead concentration levels over the last decade, and also show the high potential for exceedances with the 2008 Lead NAAQS.

GERDAU-TAMCO (Fence Line and Source-Oriented Monitors – Rule 1420 & Lead NAAQS)

GERDAU North America acquired the TAMCO Rancho Cucamonga steel mini mill in October 2010. In 2012, Environ Corp. was retained to perform an environmental audit and found discrepancies in reported lead emissions. SCAQMD staff conducted inspections of the facility to address issues and continues monitoring for lead and other metals at the facility. Four onsite monitors maintained by GERDAU-TAMCO operate on a 1-in-3 day sampling schedule to monitor the site for compliance with Rule 1420. These monitors are generally located in four locations along the fence line of the facility. Two additional monitors are independently operated and maintained by the SCAQMD. As demonstrated by Figure 1-4 below, the SCAQMD monitors are collocated with the GERDAU-TAMCO SA Recycling monitor (#1) and the GERDAU-TAMCO south baghouse monitor (#2). Recent results of the GERDAU-TAMCO monitoring efforts show GERDAU-TAMCO as a source of lead emissions that potentially could contribute to an exceedance of the NAAQS. Further, recent NAAQS modeling information submitted by GERDAU-TAMCO to SCAQMD staff demonstrates the potential for a NAAQS exceedance near the south baghouse location.

Figure 1-4: GERDAU-TAMCO Fence Line & Source-Oriented Monitors



AFFECTED SOURCES

Based on lead emissions inventories reported to the SCAQMD AER program for years 2010 through 2012 and information available from the SCAQMD permitting database, there are approximately 14 metal melting facilities expected to be subject to PR 1420.2. Cumulatively

these facilities process more than 50,000 tons of lead annually through a combination of metal melting furnaces. These facilities manufacture a variety of products and are classified in the Standard Industrial Classification codes as 3691 (Storage Battery Production), 3444 (Sheet Metal Work) 3312 (Steel Works, Blast Furnaces, and Rolling Mills), 3369 (Nonferrous Foundries, Except Aluminum and Copper), 3341 (Secondary Smelting and Refining of Nonferrous Metals), 3400 (Fabricated Metal Products, Except Machinery and Transportation Equipment) and 9999 (Non-classifiable Establishments). The facilities range in size from small to large scale operations. The universe of facilities subject to PR 1420.2 includes both foundries and secondary smelters classified in the Standard Industrial Classification Manual under the codes identified in Table 1-1 below. Table 1-2 provides an overview of the estimated annual lead throughput and annual reported lead emissions at metal melting facilities subject to PR 1420.2.

Table 1-2: Types of Facilities Subject to PR 1420.2

SIC Code	Facility Type	# of Facilities
2819	Chemical Manufacturing	1
3312	Steel Works, Blast Furnaces, and Rolling Mills	1
3341	Secondary Smelting and Refining of Nonferrous Metals	2
3369	Nonferrous Foundries, Except Aluminum and Copper	1
3400	Fabricated Metal Products, except Machinery and Transportation Equipment	1
3444	Sheet Metal Work	1
3691	Storage Battery Production	6
9999	Non-classifiable Establishments	1
Total Number of Facilities		14

Table 1-3: PR1420.2 Overview of Estimated Annual Lead Throughput at Metal Melting Facilities 2010-2012

Value	10 to <100 tons/year	100 to <500 tons/year	500 to <1000 tons/year	1000 tons/year or more
# of facilities based on annual lead melted (in tons/year)	None	5	3	6

INDUSTRY PROCESS DESCRIPTION, LEAD EMISSION POINTS AND CONTROL STRATEGIES

The following paragraphs provide a general overview of the manufacturing processes and emission sources for the industry source category subject to Proposed Rule 1420.2. Specifically, SCAQMD staff has provided general operation and emissions source information for iron and steel mills, secondary metal processing, foundries, and lead-acid battery storage production.

IRON AND STEEL MILLS

Background

Steel mini-mills are the largest scrap metal recyclers in the United States. The scrap metal originates from sources such as scrapped automobiles, demolished buildings, discarded home appliances, and manufacturing returns. Mini-mills accounted for 57 percent of the national steel production in 2006. The applicable NAICS code for this industry is 331110, Iron and Steel Mills and Ferroalloy Manufacturing. Given that the industry source category for this rulemaking applies to one existing steel mini-mill in the Basin, the following process description reflects the operational characteristics at similar facilities.

Process Description

Steel is manufactured by chemical reduction of iron ore using an integrated steel manufacturing process or a direct reduction process. In conventional integrated steel manufacturing processes, iron from a blast furnace is converted to steel in a basic oxygen furnace (BOF). However, steel can also be produced using an electric arc furnace (EAF) from scrap metal. BOF is typically used for high-tonnage production of carbon steels while EAF's are used to produce carbon steels and low-tonnage specialty steels. In the BOF process, coke making and iron making precede steelmaking; these steps are not necessary with an EAF.

- **Electric Arc Furnace (Metal Melting - Steel Production)**

An EAF is a cylindrical, refractory-lined container, and when electrodes are retracted from the furnace, its roof can be rotated aside to permit scrap metal charging (feeding) into the furnace. The charging material is typically scrap metal that is charged by an overhead crane. Steel production using an EAF includes stages such as charging, melting, refining, slagging, and tapping. Each of these stages are described below.

- o **Charging**

During the charging stage, scrap metals are fed into the EAF. The charge can also include carbon and lime, a fluxing agent which removes chemical impurities out of the metal and renders slag that is more liquid at smelting temperatures. The slag is a liquid mixture of ash, flux, and other impurities. Direct reduced iron (DRI) or other iron-bearing material can supplement the scrap metal. DRI, also known as "sponge iron", is a type of iron created by heating iron ore to burn off carbon and oxygen while the temperature is kept below iron's melting point.

- o Melting

The furnace roof is rotated back to close the furnace and carbon electrodes are lowered through openings in the furnace roof. Electric current generates heat between the electrodes and through the scrap to melt the scrap. Oxy-fuel burners and oxygen lances may also be used to supply chemical energy. Oxy-fuel burners, which burn natural gas and oxygen, use convection and flame radiation to transfer heat to the scrap metal. Oxygen is directly injected through oxygen lances into the molten steel. Exothermic reaction with the iron and other components provides additional energy to assist in the melting of the scrap metal and excess carbon. Alloys may be added to achieve the desired composition.
- o Refining

Refining of molten steel can take place simultaneously with melting process, especially in EAF operations where oxygen is introduced. During the refining process, substances that are incompatible with iron and steel are separated out by forming a layer of slag on top of the molten metal.
- o Slagging

The slag layer consists primarily of oxides of calcium, iron, sulfur, silicon, phosphorus, aluminum, magnesium, and manganese in complexes of calcium silicate, aluminosilicates, and aluminoferrite. The slag is typically removed by tipping the furnace backwards and pouring the molten slag out through a slag door.
- o Tapping

After completion of the EAF batch process, the tap hole is opened, and the hot steel is poured from the EAF into a ladle for transfer to the next operation.
- Secondary Refining
 - o Argon Oxygen Decarburization (AOD)

AOD is a process that further refines the steel outside the EAF during the production of certain stainless and specialty steels. In the AOD process, steel from the EAF process is transferred into an AOD vessel, and gaseous mixtures containing argon and oxygen or nitrogen are blown into the vessel to reduce the carbon content of the steel. Argon assists the carbon removal by increasing the affinity of carbon for oxygen.
 - o Ladle Metallurgy

After initial smelting and refining of the steel in the EAF, molten steel is further refined in a ladle furnace undergoing chemical and thermal homogenization. The molten steel may receive alloy additions to produce the desired metallurgy.
- Casting and Finishing
 - o Continuous Casting

A ladle with molten steel is lifted to the top of a continuous caster, where it flows into a reservoir (called a tundish) and then into the molds of the continuous casting

machine. Steel passes through the molds and then is cooled and solidified into semi-finished products such as blooms, billets, or slabs.

- o Ingot Casting

Molten steel is poured into an ingot mold, where it cools and begins to solidify. The molds are stripped away, and the ingots are transferred to a soaking pit or reheat furnace where they are heated to a uniform temperature. Ingots are shaped by hot rolling into the semi-finished products such as blooms, billets, or slabs, or by forging.

- o Finishing

The semi-finished products may be further processed by a number of different steps, such as annealing, hot forming, cold rolling, pickling, galvanizing, coating, or painting. Some of these steps require additional heating or reheating. The additional heating or reheating is accomplished using furnaces usually fired with natural gas.

Process Emission Points and Controls

- EAF

During EAF steelmaking process, metal dusts and gaseous emissions are generated from charging scrap, smelting and refining, removing slag, and tapping steel. The amount and composition of the particulate matter (PM) emitted can vary greatly depending on the scrap composition and types and amount of furnace additives such as fluxes. Iron and iron oxides are the primary components of PM. In addition, zinc, chromium, nickel, lead, cadmium, and other metals may also be present in the PM. Transfer of slag removed from the EAF is a potential source of fugitive lead-dust emissions, especially when cooled slag is loaded by a front-end loader onto a truck to be transported to a different location.

Emissions from an EAF are generally captured using direct shell evacuation supplemented with a canopy hood located above the EAF. In general, the captured gases and particulate from the EAF are routed to baghouses for PM control. Some mini-mills have a common baghouse through which emissions from the EAF, as well as emissions from the ladle metallurgy process and/or continuous caster, are ducted and subsequently controlled. Fugitive dust emissions from slag loading can be controlled by applying dust suppressants or enclosing the loading area that has openings with overlapping flaps and venting the dust-laden air to a dust collector.

- Secondary Refining

The AOD vessel is a potential source of PM and gaseous emissions. A baghouse may be used to control PM emissions. The ladle furnace and ladle heater are emission sources. A roof canopy hood or a side draft hood is used to capture the emissions which are vented to a baghouse (which may be the same baghouse used for EAF emissions).

- Casting and Finishing

Fugitive particulate emissions may be generated at the caster and emitted through a roof monitor. Control devices are not generally employed for these processes. Other potential sources of emissions include reheat furnace, annealing furnaces, and other furnaces used in the finishing processes.

SECONDARY METAL PROCESSING

Source Description

Secondary metal processing, also known as metal scrap recycling, is a large industry that processes in the U.S. alone, 56 million tons of scrap iron and steel (including 10 million tons of scrap automobiles), 1.5 million tons of scrap copper, 2.5 million tons of scrap aluminum, 1.3 million tons of scrap lead, 300,000 tons of scrap zinc and 800,000 tons of scrap stainless steel, and smaller quantities of other metals, on a yearly basis. Secondary metal processing is the processing of metal-containing materials to recover and reuse the metal.

The NAICS codes for this industry are 331314 Secondary Smelting and Alloying of Aluminum; 331410 Nonferrous Metal (except Aluminum) Smelting; and 331492 Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum).

Process Description

The specifics of recovery processes vary depending on the type of metal being processed. Processes may even vary among facilities processing the same type of metal. The processes used by different industries may be grouped by one of the following general processes.

- **Raw Material Handling**
Material handling operations include receiving, unloading, storing, and conveying the metal-containing materials and auxiliary materials required for metal processing (i.e., scrap metals, fluxes, fuels, alloys, and casting materials).
- **Scrap Pretreatment**
Scrap pretreatment involves the preliminary separation of the metal of interest from other metals contained in the scrap and contaminants such as dirt and plastics. The most commonly used operations include mechanical separation, solvent cleaning, centrifugation, pyrometallurgical and hydrometallurgical cleaning, and heavy-media separation. Mechanical separation includes sorting, crushing, pulverizing, shredding, and other mechanical means to break scrap into small pieces.
- **Metal Melting/Smelting**
Melting is performed to separate the metals of interest from their metallic compounds. Melting also allows the creation of an alloy and castings to be made from its molten metal. Smelting in nonferrous metal processing takes place in furnaces or heated crucibles. The furnaces may be heated with fuels or through the use of electricity.

Pretreated scrap, fuels, and flux materials are charged to the furnace where melting takes place. The mixture of the flux materials depends on the type of metal being processed. In secondary lead processing, for example, flux materials may consist of rerun slag, scrap iron, coke, recycled dross, flue dust, and limestone. The flux may chemically react with the scrap in the presence of heat, breaking metallic-oxide bonds to produce pure metal. Also, the flux may oxidize impurities in the scrap and further purify the metal.

- Metal Refining

Refining may take place in the melting furnace, or it may be performed in holding furnaces or other heated vessels separate from the melting furnace to further purify the metal, producing the desired properties. These furnaces are heated with fuels or with electricity. Flux materials are added to the molten metal in the furnace to remove impurities. Alloy materials are added to produce desired properties of the metal.

- Metal Forming and Finishing

The metal may be formed to make bars and ingots, or it may be formed to a final product. Bars and ingots, such as those produced in secondary lead and aluminum industries, may be sent to another facility to make a final product. In iron and steel foundries, the metal is cast into a final product at the melting facility.

Forming the metal into a final product requires the use of cores and molds. Cores are shapes used to make internal voids in castings. Molds are forms used to shape the exterior of castings. The formed metal is removed from the mold. If the formed metal is a final product, it may be necessary to grind or sand off rough edges. The metal may be shot-blasted to remove mold sand or scale.

Emissions and Control

Particulate or hazardous air pollution emissions are likely to result from hot processes that produce fumes (such as torching, welding, and melting in a furnace) or processes that produce dust (such as breaking, shredding, and cutting). Installing an exhaust system, either stationary or portable, must be deployed to capture airborne hazardous metal at the source of emissions such as melting furnaces, shredders, and cutters. Cyclones, electrostatic precipitators, and fabric filters are suitable for filterable dust. Wet scrubbers are also a common control method for dust and acidic gases.

FOUNDRIES

Source Description

A foundry is a facility that produces metal castings. Metal casting industry sector includes establishments that pour molten ferrous metals (iron and steel) or non-ferrous metals under high pressure into molds to manufacture castings. Ferrous metal castings include those castings made with gray iron, white iron, ductile iron, malleable iron, and steel. Non-ferrous metal castings are predominantly aluminum, but might also be bronze, brass, zinc, magnesium, and titanium. Cast metal components are used in the manufactured goods that include engine blocks, transmission housings, and suspension parts of cars and trucks; undercarriages of farms and construction equipment; and pipes and valves for plumbing fixtures and boilers. The applicable NAICS codes for this industry sector are 331511 Iron Foundries; 331512 Steel Investment Foundries; 331513 Steel Foundries (except Investment); 331523 Nonferrous Metal Die-Casting Foundries; 332524 Aluminum Foundries (except Die-Casting); and 331529 Other Nonferrous Metal Foundries (except Die-Casting).

Process Description

Foundry operations consist primarily of pattern/mold making, melting, pouring, cooling and finishing.

- **Pattern and Mold Making**

Pattern making is the first stage of developing a new casting. The pattern becomes permanent so can be used to form a number of permanent molds. Cores are produced in conjunction with the pattern to form the interior surfaces of the casting. Cores are formed by one of the binding systems.

The mold is formed in a mold box (flask), which is typically constructed in two halves to assist in removing the pattern. The bottom half of the mold (the drag) is formed on a molding board. Cores require greater strength to hold their form during pouring. Once the core is inserted, the top half of the mold (the cope) is placed on top.

- **Melting and Pouring**

Many foundries use a high proportion of scrap to make up a charge. Therefore, foundries play an important role in the metal recycling industry. The charge is weighed and introduced into the furnace. Alloys and fluxes are added to the charge to produce the desired melt. The furnaces commonly used in the industry are described below.

Molten metal is transferred from the furnace to a ladle and held until it reaches the desired pouring temperature. The molten metal is poured into the mold and allowed to solidify.

- **Cupola Furnace**

A typical cupola furnace consists of a water-cooled vertical cylinder which is lined with refractory material. Cupolas are charged in alternating layers of scrap metal, alloying materials, limestone, and coke through an opening in the cylinder. Air is introduced into the cupola through tuyeres located at the base. The heat produced by the burning coke melts the iron, which flows down and is tapped from the bottom of the cupola. Flux combines with non-metallic impurities in the charge and forms slag, which is drawn off through holes located above the level of the metal tap hole.

- **Induction Furnace**

An induction furnace is an electric melting furnace that uses heat generated by electric induction to melt metal. These furnaces have excellent metallurgical control and are relatively pollution free in comparison to cupola furnaces. A high voltage in the primary coil induces a low-voltage, high current across the metal charge which acts as a secondary coil. Because of electrical resistance in the metal, this electrical energy is converted to heat which melts the charge. Once the metal is in its molten state, the magnetic field produces a stirring motion. In a coreless induction furnace, the refractory-lined crucible is completely surrounded by a water-cooled copper coil, which prevents the primary induction coil from overheating. In a channel induction furnace, the induction coil surrounds the inductor.

- Electric Arc Furnace
An EAF is another type of electric furnace used in larger foundries and mini-mills steelmaking operations. The scrap metal charge is placed on the hearth and melted by the heat from an electric arc formed between the electrodes. In a direct-arc furnace, the electric arc comes into contact with the metal; in an indirect-arc furnace, the electric arc does not touch the metal. EAFs are more tolerant of dirty scrap than induction furnaces and can be used to refine metals, allowing steel to be refined from iron charge.
- Reverberatory Furnace
Reverberatory furnaces are designed and operated to produce a soft, nearly pure lead product. Reverberatory furnaces emit high levels of lead fume during charging and tapping lead and slag.
- Rotating Furnace
A rotating furnace consists of a refractory-lined cylinder that rotates slowly around a horizontal axis. The charge is heated directly from an open flame, typically fed by gas or oil. Exhaust gases are extracted from the opposite end of the chamber. Rotating the furnace helps to mix the charge and utilizes heat from the whole refractory surface.
- Crucible Furnace
Crucible furnaces are mostly used by smaller foundries or for specialty alloy lines. The crucible or refractory container is heated in a furnace, typically fired with natural gas or liquid propane.
- Cooling and Shakeout
Once the metal has been poured, the mold is transported to a cooling area. The casting needs to cool before it can be removed from the mold. Castings may be removed manually or using vibratory tables that shake the refractory material away from the casting. Quenching baths are also used in some foundries to achieve rapid cooling of castings. The quench bath may contain chemical additives to prevent oxidation.
- Sand Reclamation
A significant proportion of the waste sand is reclaimed mechanically or thermally for reuse. Cores, metal lumps, and binders are removed by vibrating screens and extraction, and collected in a baghouse. Thermal reclamation process heats the sand to the point where organic materials, including the binders, are driven off. The sand is returned to an “as new” state, allowing it to be used in core making.
- Finishing
Finishing process such as fettling involves the removal of the casting from the gating systems. This is accomplished by cutting, grinding, and chiseling.

Emissions and Control

Air emissions result from various operations in foundries, including metal melting, mold making, handling foundry sand, and die-casting. The majority of metal emissions come from the metal melting operations, while most organic emissions are from handling the binder. Once the binder

is combined with the sand, there may be additional PM emissions from pouring the molten metal into the casting and from breaking apart the cast. Handling foundry sand results primarily in PM emissions. Fugitive particulate can be emitted from operations of unloading, storage, transfer, and preparation.

The casting or mold pouring and cooling operations in iron and steel foundries are potentially a source of lead emissions. In addition, mold preparation and casting shakeout (removal from the mold) activities are also lead emission sources.

Baghouses and wet scrubbers are common technologies used to control lead emissions from foundry metal melting operations. Fugitive emissions from such sources are generally controlled with local hooding or building ventilation systems that are ducted to a control device (predominantly baghouses).

STORAGE BATTERY MANUFACTURING

Source Description

Today's major use of lead is in lead-acid storage batteries. The electrical systems of vehicles, ships, and aircraft depend on such batteries for start-up, lighting, and ignition (SLI) and, in some cases, batteries provide the actual motive power. The NAICS code for this industry sector is 335911 Storage Battery Manufacturing.

Process Description

Operations consist primarily of grid casting, paste mixing, pasting, burning, battery assembly, formation and lead recovery.

- **Grid Casting**
Lead alloy ingots are melted in a gas-fired lead furnace at approximately 700 degrees F. The furnace is often equipped with a hood to vent the fumes to an emission control device. The molten lead flows into molds that form the battery grids. They are then ejected, trimmed, and stacked.
- **Lead Oxide Production and Paste Mixing**
The paste mixing is conducted in a batch-type process to make paste for application to the grids. A mixture of lead oxide powder, water, sulfuric acid, and an organic expander (generally mixture of barium sulfate, carbon black, and organic fibers) are added to the mixer, depending on whether the paste batch is for positive or negative plates. The mixture is blended to form a stiff paste. A duct system vents the exhaust gases from the mixer and loading station to an emission control device.
- **Grid Pasting**
Pasting machines force the lead sulfate paste into the interstices of the grid structure (the grids are called plates after the paste has been applied). The freshly pasted plates are transported through a temperature-controlled heated tunnel, where the surface water is removed. No emission control is generally provided or needed for grid pasting and plate drying operations. The floor area around pasting operations must be kept clean of paste,

however, since this is a potential source of fugitive dust. After the plates are cured for up to 72 hours, they are sent to the assembly operations where they are stacked in an alternative positive and negative block formation.

- Lead Burning

Leads are welded to the tabs of each positive plate and each negative plate, fastening the assembly (element) together. An alternative to this operation is the “cast-on-strap” process, where molten lead is poured around and between the plate tabs to form the connection. Then a positive and a negative tab are independently welded to the element. The completed elements can go to either the wet or dry assembly lines.

- Battery Assembly

In the wet battery line, elements are placed in battery cases made of durable plastic or hard rubber. Covers are sealed to the cases, and the batteries are filled with diluted sulfuric acid and made ready for formation. For dry batteries, elements are formed prior to be placed in a sealed case.

- Formation

The inactive lead oxide-sulfate paste is chemically converted into an active electrode. Lead oxide in the positive plates is oxidized to lead peroxide; in the negative plates, it is reduced from to metallic lead. This is accompanied by placing the unformed plates in a diluted sulfuric acid solution and connecting the positive plates to the positive pole of a direct current (D.C.) source and the negative plates to the negative pole of a D.C. source.

- Lead Recovery

Defective parts are either reclaimed at the battery plant or sent to a secondary lead smelter for recycling. Pot-type furnaces are generally used for reclaiming scrap lead at the battery manufacturing plants. Because of the relatively low operating temperatures, emission concentrations are low. Emissions generally are visible only when oily scrap or floor sweepings are charged.

Emissions and Control

Lead and other PM are generated in several operations within storage battery production. Fabric filtration is generally used as part of the process control (i.e., product recovery equipment) and to collect particulate emissions from lead oxide mills. Fabric filters have become an accepted method for controlling emissions from grid casting and lead reclamation. Specifically, cartridge collectors and high efficiency particulate air (HEPA) filters can be used in grid casting, paste mixing, lead oxide manufacturing, the three-process operation, or lead reclamation. Cyclone mechanical collectors often precede fabric filters.

CHAPTER 2: SUMMARY OF PROPOSED RULE 1420.2

**OVERALL APPROACH
PROPOSED RULE 1420.2**

OVERALL APPROACH

Proposed Rule 1420.2 establishes core requirements for all metal melting facilities, and if the ambient air concentration limits are exceeded, then affected facilities are required to submit a Compliance Plan with additional lead reduction measures that can be implanted to ensure compliance with the ambient air lead concentration limits. The core requirements include installation of ambient air lead monitors, compliance with ambient air lead concentration limits, point source control requirements, housekeeping and maintenance requirements, and source testing. Representatives from the Rule 1420.2 Working Group suggested that additional requirements beyond these “core requirements” be identified in a Compliance Plan and that submittal and implementation of the Compliance Plan would be required, only if needed. The objective of the Compliance Plan is to ensure lead reduction measures are implemented, if needed, to ensure the facility can achieve the final ambient air lead concentration limit.

PROPOSED RULE 1420.2

PR 1420.2 will address lead emissions generated from metal melting facilities. The intent of the rule is to reduce lead emissions and ambient air concentrations of lead, reduce public health impacts by reducing the exposure to lead, and to help ensure attainment and maintenance of the NAAQS for lead. As a result, the rule proposes requirements for point source lead emission controls and standards and ambient air lead concentration limits. Fugitive lead emissions are addressed through housekeeping and maintenance activity requirements, and total enclosures of areas where metal melting operations and associated operations are conducted. Additionally, periodic source testing, ambient air monitoring, reporting and recordkeeping requirements are also being proposed to ensure continuous compliance. Metal melting facilities that exceed the ambient air concentration limits of PR 1420.2 will be subject to additional requirements including enhanced emission controls, total enclosures with negative air, housekeeping measures, and compliance plan submittal.

Applicability

PR 1420.2 applies to metal melting facilities in the SCAQMD that melt 100 tons or more of lead annually. Based on SCAQMD staff analysis of compliance and permitting data, there are currently 14 facilities in the District that meet the applicability of the proposed rule. These facilities represent the largest stationary source category of reported lead emissions in the Basin and include facilities such as scrap recyclers, iron and steel mini-mills, aerospace, and lead-acid battery manufacturers. Additionally, as discussed in Chapter 1, data from SCAQMD monitors at two metal melting facilities have shown the potential for this source category to exceed the NAAQS lead limit of $0.15 \mu\text{g}/\text{m}^3$ averaged over a rolling 3-month period. A minimum process limit of 100 tons of lead melted a year was set as the threshold for rule applicability due to the fact that a PR 1420.2 facility melting a little over this amount resulted in high ambient air lead concentrations at the fence line. PR 1420.2 is more stringent than Rule 1420, therefore facilities that are subject to and comply with PR 1420.2 will be exempt from Rule 1420 requirements.

Definitions

PR 1420.2 includes definitions of the following terms used in the proposed rule. Please refer to subdivision (c) of PR 1420.2 for the definitions:

- Ambient Air
- Casting
- Duct Section
- Dust Suppressant
- Emission Collection System
- Emission Control Device
- Fugitive Lead-Dust
- Furnace, Refining, or Casting Area
- Lead
- Leeward Wall
- Maintenance Activity
- Materials Storage and Handling Area
- Measurable Precipitation
- Metal
- Metal Melting Facility
- Partial Enclosure
- Point Source
- Process
- Sensitive Receptor
- Slag
- Smelting
- Smelting Furnace
- Total Enclosure
- Windward Wall

Requirements

Subdivisions (d) through (l) of PR 1420.2 establish key “core” requirements including ambient air lead concentration limits, ambient air monitoring and sampling, point source emissions controls, total enclosures, housekeeping measures, maintenance activity requirements, source testing, recordkeeping, and reporting. Requirements for submitting and implementing a Compliance Plan are specified in subdivision (m) and subdivision (n) includes exemptions.

Subdivision (d) – Ambient Air Lead Concentration Limit

Upon adoption of PR 1420.2, metal melting facilities will be required to meet an ambient air lead concentration limit of $0.150 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days. For metal melting facilities that install a rule-required ambient air lead monitor after adoption of Rule 1420.2, the ambient lead concentration limit of $0.150 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days must be met on and after 90 days from the date the ambient air monitoring plan is approved. The 90 days provides a 30-day time period after the ambient monitors are required to be installed before the $0.150 \mu\text{g}/\text{m}^3$ lead concentration limit is effective.

On and after January 1, 2018, metal melting facilities subject to PR 1420.2 will not be allowed to discharge into the atmosphere emissions which contribute to ambient air concentrations of lead that exceed $0.100 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days. Measurements recorded at any rule-required ambient air lead monitor, including any District-installed monitor, are subject to compliance with the limit.

The objective of the proposed requirement is to be more protective of public health by limiting the lead concentration in the ambient air. By limiting the ambient air lead concentration to the $0.100 \mu\text{g}/\text{m}^3$ by 2018, it will further reduce the accumulation of lead dust and reduce lead exposure from metal melting facilities to the surrounding community. Lowering the ambient air lead concentration is not inconsistent with studies that U.S. EPA reviewed indicating that lower ambient air lead concentrations would result in less impacts to children. According to U.S. EPA, the assessment of the currently available studies continues to recognize a non-linear relationship between blood lead and effects on cognitive function, with a greater incremental effect (greater slope) at lower relative to higher blood lead levels.¹ Chronic health effects include increased risk of cancer, nervous and reproductive system disorders, neurological and respiratory damage, cognitive and behavioral changes, and hypertension. In addition, young children accumulate lead more readily than do those of adults are more vulnerable to certain biological effects of lead including learning disabilities, behavioral problems, and deficits in IQ.

Subdivision (e) – Ambient Air Monitoring and Sampling Requirements

PR 1420.2 facilities will be required to collect and analyze ambient air lead samples to determine compliance with the ambient air quality lead concentration limits of the rule. This subdivision provides the requirements for submittal of an ambient air monitoring plan, the number of monitors, placement of monitors, and installation of monitors.

PR 1420.2 requires that 24-hour lead samples be collected and requires that samples be collected midnight-to midnight at all sites, but does allow for a different sampling schedule based on approval of the Executive Officer. Refer to PR 1420.2 for more details. Facilities will also be required to continuously monitor wind speed and direction for the ambient air quality monitoring system at all times to supplement data analysis of samples collected. Only personnel approved by the Executive Officer will be allowed to conduct ambient air quality monitoring, and sampling equipment shall be operated and maintained in accordance with U.S. EPA-referenced methods.

Cleaning activities, such as wet washing and misting, that result in damage or biases to samples collected, will not be allowed within 10 meters of any sampling site required by the rule. Additionally, all ambient air quality monitoring systems will be required to be equipped with a backup, uninterruptible power supply sufficient to power monitors for use during a power outage. Any existing ambient air monitoring network currently in use for Rule 1420 shall be used for compliance with PR 1420.2 so long as all rule requirements for sampling and monitoring have been met.

Subdivision (f) – Point Source Emission Controls

Point sources are defined by the proposed rule as any process, equipment, or total enclosure used at a melting facility whose emissions pass through a stack or vent designed to direct or control its release into the ambient air. All lead emissions from lead point sources are required to be vented to a lead control device. Proposed requirements for lead point source emission controls will be effective beginning January 1, 2016 in order to give facilities ample time to apply for permits and construct all necessary lead control devices.

¹ U.S. EPA's "Policy Assessment for the Review of the Lead National Ambient Air Quality Standards," Environmental Protection Agency, May 2014

PR 1420.2 requires that lead point source emission controls meet a minimum lead reduction efficiency of 99 percent. The 99 percent lead reduction efficiency is more stringent than the 98 percent lead reduction efficiency requirement of Rule 1420. Upon review of District-approved source tests of lead point sources, SCAQMD staff determined that the more stringent 99 percent lead reduction efficiency for this source category was achievable with controls available today.

PR 1420.2 allows the owner or operator of a lead melting facility to demonstrate that lead point source emission rate is less than 0.080 pounds per hour in lieu of demonstrating the 99 percent lead reduction efficiency. The 0.080 pounds per hour is representative of a level of lead emissions that would require the facility to install additional controls. In 2008, the U.S. EPA determined that a facility lead emissions (point source and fugitives) of 0.5 tons per year represent an estimate of the lowest lead emission rate that could result in lead concentrations exceeding the NAAQS for lead. SCAQMD staff assumed an operation schedule of 24 hours/day, 365 days/year to arrive at an hourly lead emission rate from the facility of 0.114 pound/hour. PR 1420.2 proposes a final ambient air lead concentration limit of $0.100 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days, therefore the 0.114 pound/hour lead emission rate threshold was scaled down proportionately resulting in an emission rate limit of 0.080 pound/hour.

All filters and filter bags used in any lead control device are required to be rated by the manufacturer to achieve a minimum of 99.97% capture efficiency for 0.3 micron particles, or made of polytetrafluoroethylene membrane material. Any other material that is equally or more effective for the control of lead emissions may be used so long as it is approved by the Executive Officer.

Subdivision (g) – Total Enclosures

No later than January 1, 2016, the specified areas below will be required to be located within a total enclosure. The areas may be enclosed individually or in groups. The intent of this requirement is to provide maximum containment and minimize fugitive lead-dust emissions generated in areas where melting, processing, handling and storage of lead-containing materials occur. Areas to be located within a total enclosure will include:

- Furnace, refining, or casting areas;
- Lead oxide production areas; and
- Materials storage and handling areas, excluding areas where raw, unprocessed lead-containing materials or finished lead-containing products are stored.

Cross-draft conditions of a total enclosure that decrease the efficacy of the emission collection system for any lead point emission source shall be minimized by closing any openings including, but not limited to, vents, windows, passages, doorways, bay doors, and roll-ups during metal melting operations.

Subdivision (h) – Housekeeping Requirements

The following housekeeping requirements are proposed to minimize fugitive lead-dust emissions. All requirements will be effective within 30 days of rule adoption with the exception of the requirement to pave, concrete, asphalt, or otherwise stabilize all facility grounds, which will be effective no later than 180 days after rule adoption.

- Clean by wet wash or vacuum particles in a manner that does not generate fugitive lead-dust, the following areas at the specified frequencies, unless located within a total

enclosure vented to a lead emission control device. Days of measurable precipitation in the following areas occurring within the timeframe of a required cleaning frequency may be counted as a cleaning.

- Monthly cleanings of roof tops on structures ≤ 45 feet in height that house areas that are associated with the storage, handling or processing of lead-containing materials;
 - Quarterly cleanings, no more than 3 calendar months apart, of roof tops on structures > 45 feet in height that house areas associated with the storage, handling or processing of lead-containing materials;
 - Weekly cleanings of all areas where lead-containing wastes generated from housekeeping activities are stored, disposed of, recovered or recycled; and
 - Initiate immediate cleaning, no later than one hour, after any maintenance activity or event including, but not limited to, accidents, process upsets, or equipment malfunction, that causes deposition of fugitive lead-dust onto specified areas in the rule. If the facility can demonstrate that delays were due to safety or timing issues associated with obtaining equipment required to implement this requirement, immediate cleanings of rooftops shall be completed within 72 hours.
- Paving, concreting, asphaltting all facility grounds, or use of dust suppressants, for the purpose of providing a surface that accommodates ease of cleaning.
 - Removal of weather caps on any stack that is a lead emissions source.
 - Storage of all materials capable of generating any amount of fugitive lead-dust in sealed, leak-proof containers, unless located within a total enclosure. Examples of materials include slag, spent filters used in lead control devices, and lead-containing waste generated from housekeeping requirements.
 - Transport of all materials capable of generating any amount of fugitive lead-dust emissions within closed conveyor systems or in sealed, leak-proof containers, unless conducted within a total enclosure.
 - Facility grounds cleaning using onsite mobile vacuum sweepers or vacuums equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles. Facilities will be required to vacuum sweep all facility areas subject to vehicle and foot traffic with a vacuum or an onsite mobile vacuum sweeper that complies with District Rule 1186. Vacuum sweeping will be required three times each day, occurring at least once per operating shift with each event not less than four hours apart.
 - Post signs at all entrances and truck loading and unloading areas indicating a speed limit of 5 miles per hour or less on any roadway located within 75 feet of the perimeter of a total enclosure and 15 miles per hour or less on any roadway located at more than 75 feet from the perimeter of a total enclosure.

Onsite Mobile Vacuum Sweepers

Another proposed requirement intended to reduce fugitive lead-dust emissions is periodic facility sweepings using onsite mobile vacuum sweepers. Additionally, any accidents, mishaps and/or process upsets occurring in the aforementioned areas that result in the deposition of lead-containing material or dust shall be vacuum swept immediately, no later than one hour after occurrence. Further, sweeping will not be required on any day where the onsite measured rain amount is greater than 0.01 inches in any 24-hour calendar day. Facilities may use locally recorded and reported measured rain amounts.

Subdivision (i) – Maintenance Activity Requirements

The maintenance activity requirements of PR 1420.2 are effective upon rule adoption. For purposes of the proposed rule, maintenance activity is defined as any of the following activities conducted outside of a total enclosure that generates fugitive lead-dust:

- Building construction, demolition, or the altering of a building or permanent structure, or the removal of one or more of its components that generates fugitive lead-dust;
- Replacement or repair of refractory, filter bags, or any internal or external part of equipment used to process, handle, or control lead-containing materials;
- Replacement of any duct section used to convey lead-containing exhaust;
- Metal cutting or welding that penetrates the metal structure of any equipment used to process lead-containing material, and its associated components, such that lead dust within the internal structure or its components can become fugitive lead-dust;
- Resurfacing, repair, or removal of ground, pavement, concrete, or asphalt; or
- Soil disturbances, including but not limited to, soil sampling, soil remediation, or activities where soil is moved, removed, and/or stored.

The owner or operator of a metal melting facility will be required to conduct any maintenance activity that is not done in a total enclosure, inside a negative air containment enclosure that is vented to a permitted negative air machine equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles. The negative air containment shall enclose all affected areas where the potential for fugitive lead-dust generation exists. If the maintenance activity cannot be conducted in a negative air containment enclosure due to physical constraints, limited accessibility, or safety issues when constructing or operating the enclosure, the facility will be required to conduct the activity under the following conditions:

- In a partial enclosure, barring conditions posing physical constraints, limited accessibility, or safety issues;
- Using wet suppression or a vacuum equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron particles, at locations where the potential to generate fugitive lead-dust exists prior to conducting and upon completion of the maintenance activity. Wet suppression or vacuuming will also be required during the maintenance activity barring safety issues;
- While collecting 24-hour samples at monitors for every day that maintenance activity is occurring notwithstanding paragraphs (e)(2) through (e)(5). For unplanned maintenance activity, if sampling is not being conducted on the day the incident occurs, sample collection shall begin at midnight at the end of the day on which the incident occurs;
- Maintenance activity conducted outside a negative enclosure must stopped immediately if instantaneous wind speeds are 20 miles per hour or greater. Maintenance work may be continued if it is necessary to prevent the release of lead emissions;
- All concrete or asphalt cutting or drilling performed outside of a total enclosure shall be performed under 100% wet conditions; and
- Grading of soil shall only be performed on soils sufficiently wet to prevent fugitive dust.

All lead-contaminated equipment and materials used for any maintenance activity requires immediate storage or cleaning after completion of work, by wet wash or a vacuum equipped with a filter(s) rated by the manufacturer to achieve a 99.97% capture efficiency for 0.3 micron

particles. Storage and cleaning must be done in a manner that does not generate fugitive lead-dust.

Subdivision (j) – Source Tests

The proposed rule will require annual source tests for all lead control devices in order to demonstrate compliance with the lead control reduction efficient for any lead point source emission control of 99%. Initial source tests for new and modified lead control devices with an initial start-up date on or after the adoption date of the proposed rule will be required within 60 days of initial start-up. Existing lead control devices in operation before the adoption date of the rule will require a source test no later than six months after adoption of the rule. An existing source test, for existing lead control devices, conducted on or after January 1, 2014 may be used as the initial source test as long as the test:

- Is the most recent conducted since January 1, 2014;
- Demonstrated compliance with the applicable control standard;
- Is representative of the method to control emissions currently in use; and
- Was conducted using applicable and approved test methods.

The rule lists the following applicable test methods:

- SCAQMD Method 12.1;
- ARB Methods 12 and 436; and
- EPA Method 12.

Use of an alternative or equivalent test method will be allowed as long as it is approved in writing by the Executive Officer, in addition to the California Air Resources Board, or the U.S. EPA, as applicable. Facilities will be required to submit a pre-test protocol to the Executive Officer at least 60 calendar days prior to conducting the source test. Notification to the Executive Officer in writing shall also be required one week prior to conducting the source test.

The proposed rule provides an incentive for lead control devices that demonstrate exemplary lead emission rate source test results. If an annual source test to demonstrate compliance with the lead point source emission standards of subdivision (f) demonstrate a 99% or greater reduction of lead emissions, and total facility mall lead emissions of less than 0.020 pounds per hour, then the next test for all lead point sources shall be performed no later than 24 months after the date of the most recent test. The 0.020 pounds per hour lead emission rate was selected as it represents 25% of the 0.080 pounds/hour threshold of subdivision (f) that requires the installation of additional controls.

Subdivision (k) – Recordkeeping

PR 1420.2 will require records indicating amounts of lead-containing material processed at the facilities to be maintained by the facility. Examples of records include purchase records, usage records, results of lead content analysis, or other SCAQMD-approved verification to indicate processing amounts. Records for all rule-required housekeeping, maintenance activity, ambient air lead monitoring, and lead control device inspection and maintenance must also be maintained. All records shall be maintained for five years and maintained onsite for at least two years.

Subdivision (l) – Ambient Air Monitoring Reports

Under the proposed rule, facilities will be required to submit reports for monthly ambient air monitoring results for lead and wind data measured at each sampling location on a monthly basis. Beginning no later than 30 days after receiving Executive Officer approval of a Lead Ambient Air Monitoring and Sampling Plan, reports must be submitted by the 15th of each month for the preceding month, and must include the results of individual 24-hour samples and 30-day averages for each day within the reporting period. Facilities that are conducting ambient air monitoring and sampling already approved by the Executive Officer and meets the requirements in paragraph (e)(3), shall begin reporting no later than 30 days after rule adoption. In addition, any exceedance of the ambient air quality concentration shall be reported to the Executive Officer (1-800-CUT-SMOG) within 24 hours of receipt of completed sample analysis, followed by a written report to the Executive Officer no later than three business days after the notification.

Subdivision (m) – Compliance Plan

Compliance with PR 1420.2 is primarily based on an ambient air concentrations of lead at fence line monitors. The proposed rule is designed to control lead point source emissions and fugitive lead-dust emissions to achieve the ambient air concentration limits. Under PR 1420.2, an owner or operator of a metal melting facility is required to submit a Compliance Plan if one or more of the following occurs:

- the ambient air lead concentration is greater than $0.120 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days on and after January 1, 2017;
- the ambient lead concentration is greater than $0.100 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days on and after January 1, 2018, or;
- the point source emission rate for all lead sources is greater than 0.080 pound per hour on and after January 1, 2017.

The purpose of this provision is to address those facilities that still may have difficulty demonstrating compliance with the ambient air lead concentration limit even after implementation of PR 1420.2 core requirements. The Compliance Plan will identify additional measures to be implemented and at a minimum, each Compliance Plan submittal shall include:

- A comprehensive list of additional short term and long term lead emission reduction measures to be implemented in the event that ambient concentrations of lead exceed $0.100 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days. Additional lead emission reduction measures must include, but are not limited to:
 - More stringent housekeeping measures, such as installation and maintenance of vehicle wet wash areas additional areas for cleaning, and increased cleaning frequencies;
 - Total enclosures with negative air pursuant to the requirements in Appendix A of PR 1420.2;
 - Modification to lead point source control devices, including but not limited to process and/or operational changes, maintenance of lead point source control devices to increase the capture and/or control efficiency;
 - Installation of multi-stage lead emission control devices, including but not limited to devices that use filter media other than a filter bag(s), such as HEPA and cartridge-

- type filters rated by the manufacturer to achieve a minimum of 99.97% control efficiency for 0.3 micron particles;
- Process changes including reduced throughput limits;
- Conditional curtailments including, at a minimum, information specifying the curtailed processes, process amounts, and length of curtailment; and
- Identification of lead reduction measures to be implemented relative to increasing ranges of exceedance levels of the ambient air concentration limit. The owner or operator is required to identify initial measures necessary to achieve the ambient air lead concentration of $0.100 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days as well as additional measures to be implemented in the event that of subsequent exceedances of the $0.100 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days.

The owner or operator shall implement measures based on the schedule in the approved Compliance Plan if lead emissions discharged from the facility contribute to ambient air concentrations of lead to exceed:

- $0.150 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days on or after January 1, 2017, measured at any monitor pursuant to subdivision (e) or at any District-installed monitor; or
- $0.100 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days on or after January 1, 2018, measured at any monitor pursuant to subdivision (e) or at any District-installed monitor.

Under Proposed Rule 1420.2, the owner or operator is required to specify the schedule and prioritization of each lead emission reduction measure. As specified in paragraph (m)(5), the prioritization of lead emission reduction measures should be in order from the highest to the lowest potential lead emissions reductions. In some situations, there may be a need if there are subsequent exceedances of the ambient air concentration limits to implement lead emission reduction measures prior to the completion of implementation of initial measures. If there is information to support that implementation of initial measures will not ensure a subsequent exceedance of the ambient concentration limit of $0.100 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days, the Executive Officer may require that lead emission reduction measures be implemented prior to completion of implementation of initial measures.

In specific situations where the total facility lead point source emission rate, as determined through a source test, is greater than 0.080 pound per hour, measures to reduce lead point source emissions must be implemented first. Please refer to subdivision (m) for more details regarding implementation schedule for lead reduction measures, updating a Compliance Plan, and other requirements.

Subdivision (n) – Exemptions

PR 1420.2 provides exemptions to the ambient air monitoring and point source control requirements of the proposed rule depending on certain criteria being met. Paragraph (n)(1) allows facilities that demonstrate an operational ambient lead concentration level below $0.050 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days to be exempt from the ambient air monitoring requirements set forth in subdivision (e) upon Executive Officer approval of an air monitoring relief plan containing the following:

- Air dispersion modeling analysis that demonstrates an operational ambient air lead concentration of $< 0.050 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days.
- One (1) year of ambient air monitoring data without a single day exceeding an ambient air lead concentration of $0.050 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days. This demonstration period is only applicable to the first year of operating a District-approved ambient air monitoring and sampling network that complies with subdivision (e).
- The facility's most recent source tests approved by the District demonstrate a total facility mass lead emission rate from all lead point sources of less than 0.040 pounds per hour. Similar to the $0.050 \mu\text{g}/\text{m}^3$ ambient air concentration limit representing 50% of final ambient air lead concentration limit of the proposed rule, the lead emission rate of 0.040 pounds per hour represents 50% of the lead emission rate threshold discussed in subdivision (f).

Any violation of the ambient air lead concentration limits required by subdivision (d) or an operational increase of five (5) percent or more above recent source test levels conducted pursuant to subdivision (k) shall result in revocation of the air monitoring relief plan. Upon revocation of the air monitoring relief plan, the owner or operator of a metal melting facility shall comply with the requirements of subdivision (e) no later than 180 days after revocation of the air monitoring relief plan.

Paragraph (n)(2) of PR 1420.2 allows facilities to not be subject to the requirements of subdivision (f) for any combustion source fired on natural gas only in which metal melting does not take place. This exemption does not apply if a source test conducted pursuant to subdivision (j) by the District, or by the facility at the request of the District, demonstrates that lead emissions from the source is greater than 0.0008 pounds per hour. This emission rate limit represents 1% of the lead emission rate threshold discussed in subdivision (f).

Further, paragraph (n)(3) exempts any metal melting facility subject to the PR 1420.2 from the requirements of Rule 1420. PR 1420.2 goes beyond the requirements of Rule 1420 and effectively supersedes the requirements set forth in Rule 1420.

Appendix A – Total Enclosures with Negative Air (Conditional Requirement)

Appendix I specifies the requirements for total enclosures with negative air that are required to be included in the Compliance Plan. As specified in Appendix A, areas with a total ground surface area of 10,000 square feet or more require a minimum of three digital differential pressure monitors: one at the leeward wall of the total enclosure, one at the windward wall, and one at an exterior wall that connects the leeward and windward wall at a location defined by the intersection of a perpendicular line between this wall and a straight line between the other two monitors in order to account for shifts in draft direction throughout the enclosure. Each total enclosure is required to be maintained at a negative pressure of at least 0.02 mm of Hg (0.011 inches H₂O) and an in-draft velocity of at least 300 feet per minute at any opening such as vents, windows, passages, doorways, bay doors, and roll-ups. For smaller enclosures, at least one differential pressure monitor, continuously measuring the negative pressure of the total enclosure, is required to be installed on the leeward wall.

Digital differential pressure monitors must be capable of measuring and displaying negative pressure in the range of 0.01 to 0.2 mm Hg (0.005 to 0.11 inches H₂O) with a minimum increment of measurement of plus or minus 0.001 mm Hg (0.0005 inches H₂O). Digital differential pressure monitoring systems will also need to be equipped with a continuous strip chart recorder or electronic recorder approved by the Executive Officer. If the facility elects to use an electronic recorder, the recorder will need to be capable of writing data on a medium that is secure and tamper-proof. The recorded data needs to be readily accessible upon request by the Executive Officer. A copy of any software that is not readily available to the Executive Officer and required to access the recorded data, including all subsequent revisions, must be provided to the Executive Officer at no cost. If a device is needed to retrieve and provide a copy of such recorded data, the device must be maintained and operated at the facility.

Additionally, to ensure availability of data that may be useful in determining reasons for changes in ambient air lead concentrations during power outages, installation of a backup, uninterruptible power supply will be required on all digital differential pressure monitors. The amount of backup power supplied must be capable of sufficiently powering the monitors until processes and equipment at the facility can be safely brought down if the power outage is for a substantial period.

CHAPTER 3: IMPACT ASSESSMENT

EMISSIONS IMPACT

CALIFORNIA ENVIRONMENTAL QUALITY ACT

SOCIOECONOMIC ASSESSMENT

**DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE
SECTION 40727**

REGULATORY COMPARATIVE ANALYSIS

EMISSIONS IMPACT

PR 1420.2 affects 14 metal melting facilities that melt more than 100 tons of lead annually. Source categories include scrap recyclers, aerospace, iron and steel mini-mills, and lead-acid battery manufacturing. These facilities are currently regulated by various federal NESHAPs and state ATCMs and have installed point source emission controls in order to comply with applicable federal and state requirements to reduce lead emissions. Implementation of PR1420.2 will reduce point and fugitive emissions. Quantifying the point source emission reductions is difficult as many sources do not have current source tests and quantifying emission reductions from fugitive sources is difficult. Implementation of PR 1420.2 will reduce the ambient air lead concentration to $0.150 \mu\text{g}/\text{m}^3$ from the date of adoption, however, require facilities to meet this limit 90 days after approval of ambient air monitoring and sampling sites by the Executive Officer. The final ambient air lead concentration limit of PR 1420.2 is $0.100 \mu\text{g}/\text{m}^3$ averaged over any 30 consecutive days.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

PR 1420.2 is considered a “project” as defined by the California Environmental Quality Act (CEQA), and the SCAQMD is the designated lead agency. Pursuant to the CEQA and SCAQMD Rule 110, the SCAQMD staff will evaluate the proposed project and make the appropriate CEQA determination. The public workshop meeting will also solicit public input on any potential environmental impacts from the proposed project. Comments received at the public workshop on any environmental impacts will be considered when developing the final CEQA document for this rulemaking.

SOCIOECONOMIC ASSESSMENT

A socioeconomic analysis will be conducted and released for public review and comment at least 30 days prior to the SCAQMD Governing Board hearing on PR 1420.2, which is anticipated to be heard on July 10, 2015.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity

PR 1420.2 is needed to further protect public health by reducing lead emissions from metal melting facilities. For a toxic air contaminant, such as lead, for which there is no level of exposure that can yet be identified with confidence, as clearly not being associated with some risk of deleterious health effects, the intent of this proposed rule is to reduce emissions to the lowest level achievable through the most effective feasible control method. The proposed rule will reduce ambient lead emissions from point sources as well as fugitive emissions from facility operations.

Lowering the ambient lead concentration is not inconsistent with studies that U.S. EPA reviewed indicating that lower ambient lead concentrations would result in less impacts to children. According to U.S. EPA, the assessment of the currently available studies continues to recognize a non-linear relationship between blood lead and effects on cognitive function, with a greater incremental effect (greater slope) at lower relative to higher blood lead levels. Chronic health effects include increased risk of cancer, nervous and reproductive system disorders, neurological and respiratory damage, cognitive and behavioral changes, and hypertension. In addition, young children accumulate lead more readily than do those of adults are more vulnerable to certain biological effects of lead including learning disabilities, behavioral problems, and deficits in IQ.

Authority

The SCAQMD Governing Board has authority to adopt PR 1420.2 pursuant to the California Health and Safety Code Sections 39002, 39650 et. seq., 40000, 40001, 40440, 40441, 40702, 40725 through 40728, 41508, 41700 and 41706.

Clarity

PR 1420.2 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency

PR 1420.2 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations.

Non-Duplication

PR 1420.2 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference

By adopting PR 1420.2, the SCAQMD Governing Board will be implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 40001 (rules to achieve and maintain ambient air quality standards), 41700 (nuisance), 41706(b) (emission standards for lead compounds from non-vehicular sources), Federal Clean Air Act Section 112 (Hazardous Air Pollutants), and CAA Section 116.

COMPARATIVE ANALYSIS

Health and Safety Code section 40727.2 requires a comparative analysis of the proposed rule with any Federal or District rules and regulations applicable to the same source. See Table 3-1 below.

Table 3-1: Comparison of PR 1420.2 with SCAQMD Rule 1420, the CARB 1998-12-30 Non Ferrous Metal Melting ATCM, the 2008 Lead NAAQS, and the NESHAP for Secondary Lead Smelters

Rule Element	PR 1420.2	SCAQMD Rule 1420	CARB 1998-12-30 Non Ferrous Metal Melting ATCM	2008 Lead NAAQS	NESHAP from Secondary Lead Smelting
Applicability	Facilities that melt 100 tons or more of lead in any calendar year	Facilities that use or process lead-containing materials	Facilities that melt non-ferrous metals including lead	All States	Secondary lead smelters
Ambient Air Quality Standard	January 1, 2016, to December 31, 2017 meet $0.120 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days. On and after January 1, 2018 meet $0.100 \mu\text{g}/\text{m}^3$ averaged over 30 consecutive days.	$1.5 \mu\text{g}/\text{m}^3$ averaged over 30 days	None	$0.15 \mu\text{g}/\text{m}^3$: 3-month rolling average Demonstrated over a 3-year period.	None
Total Enclosures	Total enclosure for furnace, refining, casting and lead oxide production areas as well as material storage and handling areas excluding raw unprocessed lead-containing materials or finished lead-containing products	None	Enclosed storage area for dust-forming material including, but not limited to, dross, ash, or feed material	None	Total or partial enclosures for: - Smelting furnace and dryer charging hoppers, chutes, and skip hoists; - Smelting furnace lead taps, and molds during tapping; - Refining kettles; - Dryer transition pieces; and Agglomerating furnace product taps

Rule Element	PR 1420.2	SCAQMD Rule 1420	CARB 1998-12-30 Non Ferrous Metal Melting ATCM	2008 Lead NAAQS	NESHAP from Secondary Lead Smelting
Emission Standard and Requirements for Lead Control Devices	99% control efficiency for lead	99% control efficiency for particulate matter; 98% control efficiency for lead	99% control efficiency	None	Concentration of 2.0 mg/dscm
Compliance Plan	Only required if a facility exceeds ambient lead concentration limit of 0.110 $\mu\text{g}/\text{m}^3$ from January 1, 2016 to December 31, 2017 or 0.100 $\mu\text{g}/\text{m}^3$ on or after January 1, 2018, or total facility point source emissions greater than 0.08 lb/hour after January 1, 2016. Identifies additional lead control measures beyond the rule.	Specifies general facility information	None	None	None
Ambient Air Monitoring Requirements	<ul style="list-style-type: none"> - Minimum of three monitors at facility locations approved by the Executive Officer - Provisions included for monitor failure - One year sample retention - Samples collected daily for facilities melting 1,000 tons per year or more. Samples collected daily or every third day for facilities melting 100 to 1,000 tons per year. Provisions 	<p>Minimum of two monitors at facility locations approved by the Executive Officer</p> <p>Samples collected every six days</p> <p>Results reported quarterly</p>	None	<p>For states, a minimum of:</p> <ul style="list-style-type: none"> - One source-oriented monitor at all facilities emitting 1.0 tons of lead/year; and - One non-source-oriented monitor in urban areas with a population of at least 500,000 people - Samples 	None

Rule Element	PR 1420.2	SCAQMD Rule 1420	CARB 1998-12-30 Non Ferrous Metal Melting ATCM	2008 Lead NAAQS	NESHAP from Secondary Lead Smelting
	<p>included to cease monitoring if lead concentration is below 0.050 ug/m3 average over 30 consecutive days, no single day exceeding 0.050 during the first year of ambient monitoring, and total facility mass lead emissions are less than 0.040 lb/hour.</p> <p>- Results reported monthly</p>			collected every six days	
Housekeeping and Maintenance Requirements	<ul style="list-style-type: none"> - Requirements for storage of dust-forming material - Daily cleaning of surfaces subject to vehicular or foot traffic - Storage and disposal, lead or lead-containing wastes in closed containers - Posted facility vehicle speed limit of 5 miles per hour on any roadway located within 150 feet of total enclosure; 15 miles per hour speed limit for roadways located more than 150 feet from total enclosure - All outside concrete or asphalt cutting performed under 100% wet conditions - Grading of soil only on 	<p>Requirements for storage of dust-forming material; weekly cleaning of surfaces subject to vehicular or foot traffic; and storage, disposal, recovery, and recycling of lead or lead-containing wastes generated from housekeeping activities</p>	<p>Surfaces subject to vehicular or foot traffic shall be vacuumed, wet mopped or otherwise maintained</p>	None	<p>Periodic wash down of plant roadways (lower frequency than PAR 1420.1); wet suppression of battery breaking area storage piles; vehicle wet washing of vehicles exiting the materials handling and storage areas</p>

Rule Element	PR 1420.2	SCAQMD Rule 1420	CARB 1998- 12-30 Non Ferrous Metal Melting ATCM	2008 Lead NAAQS	NESHAP from Secondary Lead Smelting
	soils sufficiently wet to prevent fugitive emissions				
Reporting Requirements	<ul style="list-style-type: none"> - Monthly ambient air monitoring reports - Exceedances of ambient air concentration to be reported within 24 hours - Failure to collect 24 hour sample to be reported within 2 hours of knowing the sample was not collected - Source test results to be reported within 90 days 	Ambient air lead and wind monitoring for any lead-processing facility that is required or elects to do ambient air monitoring	<ul style="list-style-type: none"> - Source test results - Amount of metal processed if requesting exemption 	For states: <ul style="list-style-type: none"> - State Implementation Plan submittal; - Periodic emissions reports from stationary source monitors; - Ambient air quality data and associated assurance data 	<ul style="list-style-type: none"> - Lead control alarm/failure reports including fugitive dust control measures performed during failures

REFERENCES

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